CERTIFIED SEBEGO SEED STOCKS AND
SEED PIECE TREATMENTS*1
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ABSTRACT

The effects of several certified Sebago seed stocks on potato stands and yields were studied in 1969 and 1970 with a USDA maintenance stock used as a control. Seed piece treatments — (i) nontreated stem-end, (ii) nontreated bud-end, and (iii) Polyram®-treated bud-ends — were incorporated into the 1970 test. Large differences among certified seed stocks and seed piece treatment for stands and yields were obtained due to the bacterial seed piece decay and/or black leg disease caused by Erwinia carotovora (Jones) Holland.

Yields of the USDA maintenance stock were significantly superior to three and seven of the certified stocks compared in 1969 and 1970, respectively. While treatment of seed from vigorous stocks did not significantly increase yields, treatment of seed from less vigorous stocks did result in significantly greater yields. In the nontreated, less vigorous seed, there was a tendency for the bud-end seed to produce greater yield than the stem-end.

INTRODUCTION

The use of sound, healthy seed stocks is imperative to successful and profitable potato production. Florida growers have observed differences in stand and yield response among several Sebago seed stocks. These differences are primarily due to incidence of bacterial seed piece decay and black leg caused by Erwinia carotovora (Jones) Holland.

Eddins, et al. (4) reported that E. carotovora is present in most Florida soils and infects the potato seed piece after it is planted. While the bacterial pathogen has been isolated from tuber fungus lesions (1), only 1% incidence of black leg has been reported as being transmitted through infected seed (1,4).

Generally, treating freshly cut seed with fungicides or fungicides plus antibiotics has not significantly modified black leg incidence, stand or yield under field conditions favoring rapid emergence. Results are summarized (2, 3, 5).

Kehr, et al. (7) reported differences in response among seed of the same variety originating in different locations to be due to “place effect.” Possible contributing causes to “place effect” are differences in: (a) seed dormancy; (b) storage conditions; (c) virulence of tuber transmitted diseases; (d) soil and moisture conditions; (e) fertilizer practices; and, (f) natural selection of somatic mutation.

This paper reports stand and yield responses of Sebago seed stocks as affected by seed piece decay and black leg. Stand and yield differences

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TABLE 1.—Stands and yields of different Sebago seed stocks — 1969.

<table>
<thead>
<tr>
<th>Seed stock</th>
<th>Days from planting</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62</td>
<td>75</td>
</tr>
<tr>
<td>USDA</td>
<td>98 a</td>
<td>98 a</td>
</tr>
<tr>
<td>MAINE</td>
<td>93 a</td>
<td>84 b</td>
</tr>
<tr>
<td>ONTARIO</td>
<td>91 a</td>
<td>90 ab</td>
</tr>
<tr>
<td>PEI</td>
<td>83 b</td>
<td>71 c</td>
</tr>
</tbody>
</table>

<sup>1</sup>Cwt/A x 1.12 = q/ha

Values within each column not having a letter in common are significantly different at the 5% level of probability.

between fungicide treated seed and nontreated seed, and between stem-end and bud-end seed pieces are also reported. Previous accounts have been reported elsewhere (8, 9).

MATERIALS AND METHODS

A number of certified Sebago seed stocks available to growers during the 1969 and 1970 seasons were tested at Hastings, Florida for stand and yield response as affected by seed piece decay and black leg. Stocks were obtained via Fruit and Vegetable Inspection Division, Florida Department of Agriculture, and compared with a USDA maintenance seed stock from Aroostook State Farm, Presque Isle, Maine. The following factors were common to both seasons: (i) Upon arrival all seed stock held under uniform conditions until planting; (ii) Soft and dry rotted tubers were removed; and, (iii) Seed was cut by hand into approximately 2 oz (57 g) pieces.

In 1969, the certified stocks from Maine, Ontario, and Prince Edward Island (PEI) (Table 1) were tested in a randomized block with five replications. Seed was planted 8 in (20 cm) apart in 24 hill units on January 28. Sixty-two days after planting, early symptoms of black leg were recorded and stand counts taken. Black leg continued to develop, and its incidence was again recorded 13 and 23 days later. Tubers were harvested on May 14.

In 1970, the experimental procedures were expanded (Tables 2, 3). The rejected seed stock was certified seed containing approximately 40% internal browning on arrival. Four days before planting each stock was divided into 10 sublots. From each sublot 15 tubers, each weighing approximately 6 oz (170 g), were selected and the number of shatter-bruised and other abraded tubers recorded. The 15 tubers were then cut into one stem-end and two bud-end pieces and half of the bud-end pieces treated with Polymyxin<sub>®</sub> (7%) dust. Seed was planted in the field in a split plot design with whole units arranged in a 10 x 10 Latin square. Whole units were seed stocks and subunits were seed piece treatments. Seed was planted 12 in (31 cm) apart in 15 hill subunits on January 29. Stand counts were taken at 43 and 47 days after planting. At 55 days emergence was complete. Declining stands associated with the black leg disease were recorded at 70 and 79 days after planting. Tubers were harvested on May 28, at which time specific gravities were determined by the weight in water-weight in air method.